

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of claims:**

5           Claims 1-45 (canceled)

Claim 46 (new):    A semiconductor light emitting element comprising:  
a semiconductor layer of a first conduction type which is formed on a major  
surface and includes a convex crystal portion having an inclined crystal plane  
10           composed of a plurality of crystal planes inclined from the major surface by  
different angles of inclination to exhibit a convex plane;  
at least an active layer and a semiconductor layer of a second conduction  
type which are sequentially layered at least on the inclined crystal plane of the  
crystal portion;  
15           a first electrode electrically connected to the semiconductor layer of the first  
conduction type; and  
a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to the  
semiconductor layer of the second conduction type.

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Claim 47 (new):    The semiconductor light emitting element according  
to claim 46 wherein the crystal portion has a wurtzite crystal structure.

Claim 48 (new):    The semiconductor light emitting element according  
25           to claim 46 wherein the crystal portion includes a nitride III-V compound  
semiconductor.

Claim 49 (new):    The semiconductor light emitting element according  
to claim 46 wherein the semiconductor layer of the first conduction type, the active  
30           layer and the semiconductor layer of the second conduction type include nitride III-  
V compound semiconductors.

Claim 50 (new): The semiconductor light emitting element according to claim 47 wherein the crystal planes composing the inclined crystal plane include S-oriented planes.

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Claim 51 (new): The semiconductor light emitting element according to claim 47 wherein the angles of inclination of the crystal planes composing the inclined crystal plane are stepwise smaller from a bottom of the crystal portion toward an apex thereof.

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Claim 52 (new): The semiconductor light emitting element according to claim 51 wherein the angle of inclination of the crystal plane including the apex in the plurality of crystal planes composing the inclined crystal plane ranges from about 60 degrees to about 65 degrees.

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Claim 53 (new): The semiconductor light emitting element according to claim 46 wherein the crystal portion is steeple-shaped.

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Claim 54 (new): The semiconductor light emitting element according to claim 46 wherein the crystal portion has a six-sided steeple configuration.

Claim 55 (new): The semiconductor light emitting element according to claim 46 wherein the crystal portion is elongate in a direction parallel to the major surface.

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Claim 56 (new): A method of manufacturing a semiconductor light emitting element having a semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined crystal plane composed of a plurality of crystal planes inclined from the major surface by different angles of inclination to exhibit a convex plane as a whole; at least an active layer and a semiconductor layer of a second conduction type which

are sequentially layered at least on the inclined crystal plane of the crystal portion; a first electrode electrically connected to the semiconductor layer of the first conduction type; and a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to the 5 semiconductor layer of the second conduction type, the method comprising:

growing a first semiconductor layer of the first conduction type on a substrate;

forming a growth mask having an opening at a predetermined position on the first semiconductor layer;

10 selectively growing a second semiconductor layer of the first conduction type on the first semiconductor layer exposed through the opening in the growth mask; and

sequentially growing at least the active layer and the semiconductor layer of the second conduction type to cover the second semiconductor layer.

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Claim 57 (new): The method of manufacturing a semiconductor light emitting element according to claim 56 wherein the growth mask includes a lamination of at least one of silicon nitride, silicon oxide nitride and silicon oxide.

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Claim 58 (new): The method of manufacturing a semiconductor light emitting element according to claim 56 wherein at least the surface of the growth mask includes silicon nitride.

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Claim 59 (new): The method of manufacturing a semiconductor light emitting element according to claim 56 wherein the size of the opening in the growth mask ranges from about 2  $\mu\text{m}$  to about 13  $\mu\text{m}$ .

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Claim 60 (new): The method of manufacturing a semiconductor light emitting element according to claim 56 wherein the crystal portion has a wurtzite crystal structure.

Claim 61 (new): The method of manufacturing a semiconductor light emitting element according to claim 56 wherein the crystal portion includes a nitride III-V compound semiconductor.

5 Claim 62 (new): The method of manufacturing a semiconductor light emitting element according to claim 56 wherein the semiconductor layer of the first conduction type, the first semiconductor layer, the second semiconductor layer, the active layer and the semiconductor layer of the second conduction type include nitride III-V compound semiconductors.

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Claim 63 (new): The method of manufacturing a semiconductor light emitting element according to claim 59 wherein the crystal planes composing the inclined crystal plane are S-oriented planes.

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Claim 64 (new): The method of manufacturing a semiconductor light emitting element according to claim 60 wherein the angles of inclination of the crystal planes composing the inclined crystal plane is stepwise smaller from a bottom of the crystal portion toward an apex thereof.

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Claim 65 (new): The method of manufacturing a semiconductor light emitting element according to claim 56 wherein the crystal portion is steeple-shaped.

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Claim 66 (new): The method of manufacturing a semiconductor light emitting element according to claim 56 wherein the crystal portion has a six-sided steeple configuration.

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Claim 67 (new): The method of manufacturing a semiconductor light emitting element according to claim 56 wherein the crystal portion is elongate in a direction parallel to the major surface.

Claim 68 (new): The method of manufacturing a semiconductor light emitting element according to claim 56 wherein growth temperature for the selective growth is controlled and from about 920°C to about 960°C.

5 Claim 69 (new): The method of manufacturing a semiconductor light emitting element according to claim 56 wherein a growth rate for the selective growth is controlled at about 6  $\mu\text{m}/\text{h}$  or greater.

10 Claim 70 (new): The method of manufacturing a semiconductor light emitting element according to claim 56 wherein the growth temperature for the active layer and the semiconductor layer of the second conduction type is set lower than the growth temperature for selective growth of the second semiconductor layer.

15 Claim 71 (new): The method of manufacturing a semiconductor light emitting element according to claim 56 wherein after the second semiconductor layer is selectively grown to have a crystal plane substantially parallel to the major surface on the top thereof, an undoped semiconductor layer is grown on the top of the second semiconductor layer.

20 Claim 72 (new): The method of manufacturing a semiconductor light emitting element according to claim 56 further comprising:

25 removing the growth mask between selectively growing the second semiconductor layer of the first conduction type on the first semiconductor layer exposed through the opening in the growth mask and sequentially growing at least the active layer and the semiconductor layer of the second conduction type.

30 Claim 73 (new): An integrated semiconductor light emitting device including a plurality of integrated semiconductor light emitting elements each comprising:

a semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined crystal plane composed of a plurality of crystal planes inclined from the major surface by different angles of inclination to exhibit a convex plane;

5 at least an active layer and a semiconductor layer of a second conduction type which are sequentially layered at least on the inclined crystal plane of the crystal portion;

a first electrode electrically connected to the semiconductor layer of the first conduction type; and

10 a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to the semiconductor layer of the second conduction type.

Claim 74 (new): A method of manufacturing an integrated  
15 semiconductor light emitting device integrating a plurality of integrated light emitting elements each having a semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined crystal plane composed of a plurality of crystal planes inclined from the major surface by different angles of inclination to exhibit a convex plane as a  
20 whole; at least an active layer and a semiconductor layer of a second conduction type which are sequentially layered at least on the inclined crystal plane of the crystal portion; a first electrode electrically connected to the semiconductor layer of the first conduction type; and a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to  
25 the semiconductor layer of the second conduction type, the method comprising:

growing a first semiconductor layer of the first conduction type on a substrate;

forming a growth mask having openings at predetermined positions on the first semiconductor layer;

selectively growing a second semiconductor layer of the first conduction type on the first semiconductor layer exposed through the openings in the growth mask; and

5 sequentially growing at least the active layer and the semiconductor layer of the second conduction type to cover the second semiconductor layer.

10 Claim 75 (new): The method of manufacturing an integrated semiconductor light emitting device according to claim 74 wherein a size of each opening in the growth mask ranges from about 4/1 to about 1 time a size of each semiconductor light emitting element.

15 Claim 76 (new): The method of manufacturing an integrated semiconductor light emitting device according to claim 74 wherein a distance between nearest two of the openings is equal to or more than two times the size of each semiconductor light emitting element.

20 Claim 77 (new): The method of manufacturing an integrated semiconductor light emitting device according to claim 74 wherein a size of each opening in the growth mask ranges from about 2  $\mu\text{m}$  to about 13  $\mu\text{m}$ .

Claim 78 (new): The method of manufacturing an integrated semiconductor light emitting device according to claim 74 wherein a distance between nearest two of the openings is equal to or more than about 10  $\mu\text{m}$ .

25 Claim 79 (new): An image display device including a plurality of semiconductor light emitting elements each comprising:

30 a semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined crystal plane composed of a plurality of crystal planes inclined from the major surface by different angles of inclination to exhibit a convex plane;

at least an active layer and a semiconductor layer of a second conduction type which are sequentially layered at least on the inclined crystal plane of the crystal portion;

5 a first electrode electrically connected to the semiconductor layer of the first conduction type; and

a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to the semiconductor layer of the second conduction type.

10 Claim 80 (new): A method of manufacturing an image display device integrating a plurality of integrated light emitting elements each having a semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined crystal plane composed of a plurality of crystal planes inclined from the major surface by different angles of 15 inclination to exhibit a convex plane; at least an active layer and a semiconductor layer of a second conduction type which are sequentially layered at least on the inclined crystal plane of the crystal portion; a first electrode electrically connected to the semiconductor layer of the first conduction type; and a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to the semiconductor layer of the second conduction type, comprising:

growing a first semiconductor layer of the first conduction type on a substrate;

25 forming a growth mask having openings at predetermined positions on the first semiconductor layer;

selectively growing a second semiconductor layer of the first conduction type on the first semiconductor layer exposed through the openings in the growth mask; and

30 sequentially growing at least the active layer and the semiconductor layer of the second conduction type to cover the second semiconductor layer.

Claim 81 (new): An illuminating device having a single semiconductor light emitting element or a plurality of integrated semiconductor light emitting elements each comprising:

- 5 a semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined crystal plane composed of a plurality of crystal planes inclined from the major surface by different angles of inclination to exhibit a convex plane;
- 10 at least an active layer and a semiconductor layer of a second conduction type which are sequentially layered at least on the inclined crystal plane of the crystal portion;
- 15 a first electrode electrically connected to the semiconductor layer of the first conduction type; and
- a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to the semiconductor layer of the second conduction type.

Claim 82 (new): A method of manufacturing an illuminating device having a single semiconductor light emitting element or a plurality of integrated semiconductor light emitting elements each including a semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined crystal plane composed of a plurality of crystal planes inclined from the major surface by different angles of inclination to exhibit a convex plane as a whole; at least an active layer and a semiconductor layer of a second conduction type which are sequentially layered at least on the inclined crystal plane of the crystal portion; a first electrode electrically connected to the semiconductor layer of the first conduction type; and a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to the semiconductor layer of the second conduction type, comprising:

30 growing a first semiconductor layer of the first conduction type on a substrate;

forming a growth mask having an opening at a predetermined position on the first semiconductor layer;

selectively growing a second semiconductor layer of the first conduction type on the first semiconductor layer exposed through the opening in the growth mask; and

sequentially growing at least the active layer and the semiconductor layer of the second conduction type to cover the second semiconductor layer.

Claim 83 (new): A semiconductor light emitting element comprising:  
10 a semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined crystal plane exhibiting a substantially convex plane as a whole;

15 at least an active layer and a semiconductor layer of a second conduction type which are sequentially layered at least on the inclined crystal plane of the crystal portion;

a first electrode electrically connected to the semiconductor layer of the first conduction type; and

20 a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to the semiconductor layer of the second conduction type.

Claim 84 (new): A method of manufacturing a semiconductor light emitting element having a semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined 25 crystal plane exhibiting a substantially convex plane; at least an active layer and a semiconductor layer of a second conduction type which are sequentially layered at least on the inclined crystal plane of the crystal portion; a first electrode electrically connected to the semiconductor layer of the first conduction type; and a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to the semiconductor layer of the second conduction type, the method comprising:  
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growing a first semiconductor layer of the first conduction type on a substrate;

forming a growth mask having an opening at a predetermined position on the first semiconductor layer;

5 selectively growing a second semiconductor layer of the first conduction type on the first semiconductor layer exposed through the opening in the growth mask; and

sequentially growing at least the active layer and the semiconductor layer of the second conduction type to cover the second semiconductor layer.

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Claim 85 (new): An integrated semiconductor light emitting device including a plurality of integrated semiconductor light emitting elements each comprising:

15 a semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined crystal plane exhibiting a substantially convex plane;

at least an active layer and a semiconductor layer of a second conduction type which are sequentially layered at least on the inclined crystal plane of the crystal portion;

20 a first electrode electrically connected to the semiconductor layer of the first conduction type; and

a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to the semiconductor layer of the second conduction type.

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Claim 86 (new): A method of manufacturing an integrated semiconductor light emitting device including a plurality of integrated semiconductor light emitting elements each having: a semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined crystal plane exhibiting a substantially convex plane; at 30 least an active layer and a semiconductor layer of a second conduction type which

are sequentially layered at least on the inclined crystal plane of the crystal portion; a first electrode electrically connected to the semiconductor layer of the first conduction type; and a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to the semiconductor layer of the second conduction type, the method comprising:

5 growing a first semiconductor layer of the first conduction type on a substrate;

forming a growth mask having openings at predetermined positions on the first semiconductor layer;

10 selectively growing a second semiconductor layer of the first conduction type on the first semiconductor layer exposed through the openings in the growth mask; and

sequentially growing at least the active layer and the semiconductor layer of the second conduction type to cover the second semiconductor layer.

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Claim 87 (new): An image display device including a plurality of semiconductor light emitting elements each comprising:

20 a semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined crystal plane exhibiting a substantially convex plane;

at least an active layer and a semiconductor layer of a second conduction type which are sequentially layered at least on the inclined crystal plane of the crystal portion;

25 a first electrode electrically connected to the semiconductor layer of the first conduction type; and

a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to the semiconductor layer of the second conduction type.

30 Claim 88 (new): A method of manufacturing an image display device integrating a plurality of integrated light emitting elements each having a

semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined crystal plane exhibiting a substantially convex plane as a whole; at least an active layer and a semiconductor layer of a second conduction type which are sequentially layered at least on the

5 inclined crystal plane of the crystal portion; a first electrode electrically connected to the semiconductor layer of the first conduction type; and a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to the semiconductor layer of the second conduction type, the method comprising:

10 growing a first semiconductor layer of the first conduction type on a substrate;

forming a growth mask having openings at predetermined positions on the first semiconductor layer;

15 selectively growing a second semiconductor layer of the first conduction type on the first semiconductor layer exposed through the openings in the growth mask; and

sequentially growing at least the active layer and the semiconductor layer of the second conduction type to cover the second semiconductor layer.

20 Claim 89 (new): An illuminating device having a single semiconductor light emitting element or a plurality of integrated semiconductor light emitting elements each comprising:

25 a semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined crystal plane exhibiting a substantially convex plane;

at least an active layer and a semiconductor layer of a second conduction type which are sequentially layered at least on the inclined crystal plane of the crystal portion;

30 a first electrode electrically connected to the semiconductor layer of the first conduction type; and

a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and electrically connected to the semiconductor layer of the second conduction type.

5        Claim 90 (new):    A method of manufacturing an illuminating device having a single semiconductor light emitting element or a plurality of integrated semiconductor light emitting elements each including: a semiconductor layer of a first conduction type which is formed on a major surface and includes a convex crystal portion having an inclined crystal plane exhibiting a substantially convex 10 plane as a whole; at least an active layer and a semiconductor layer of a second conduction type which are sequentially layered at least on the inclined crystal plane of the crystal portion; a first electrode electrically connected to the semiconductor layer of the first conduction type; and a second electrode formed on the semiconductor layer of the second conduction type on the crystal portion and 15 electrically connected to the semiconductor layer of the second conduction type, the method comprising:

          growing a first semiconductor layer of the first conduction type on a substrate;

20        forming a growth mask having an opening at a predetermined position on the first semiconductor layer;

          selectively growing a second semiconductor layer of the first conduction type on the first semiconductor layer exposed through the opening in the growth mask; and

25        sequentially growing at least the active layer and the semiconductor layer of the second conduction type to cover the second semiconductor layer.